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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 20

Application Number: 09/782,180
Filing Date: February 14, 2001
Appellant(s): SUMIKAWA ET AL.

Charles Gorenstein
Birch, Stewart, Kolasch & Birch, LLP
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 5/15/03 in Paper No. 17 and 6/16/03 in Paper No. 18.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the real party in interest is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is incorrect but was corrected in Paper No. 18 filed 6/16/03.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that: claim 1 stands or falls alone; claim 2 stands or falls alone; claim 3 stands or falls alone; claim 4 stands or falls alone; claims 5 and 6-8 stand or fall together; claims 9-12 stand or fall together; claims 13-16 stand or fall together; claim 17 stands or falls alone and claim 18 stands or falls alone and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,337,257	Toyosawa	1-2002
6,271,588	Ohuchi	8-2001
6,242,799	Horiuchi et al.	6-2001
6,136,668	Tamaki et al.	10-2000
6,150,194	Sakaguchi et al.	11-2000
6,153,448	Takahashi et al.	11-2000

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toyosawa (U.S. Pat. 6337257).

- Regarding claims 1 and 17, Toyosawa discloses a semiconductor device (figs. 2-3B, column 7, lines 30 et seq.) comprising:

a semiconductor wafer where semiconductor elements are formed (abstract) having a surface 34 provided with an external connection electrode 47;

a back surface 36 opposite that with the external connection electrode, wherein grinding scratches formed by the grinding are removed to smooth the back surface (abstract); and

the back surface 36 of the chips 32 are in contact with a protective tape (column 12, lines 29-31). It would have been obvious that the protective tape reinforced the back surface of the chip.

3. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toyosawa (U.S. Pat. 6337257) in view of Ohuchi (U.S. Pat. 6271588).

Toyosawa discloses the claimed invention except for not specifically point out that the protective tape reinforced the back surface of the chip is formed of resin.

Ohuchi discloses a protective tape 22 is formed of resin (column 2, lines 46-50) to achieve a bonding function. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Toyosawa to achieve a bonding function for the semiconductor device, as shown by Ohuchi.

- Regarding claim 4, Ohuchi discloses wherein the resin is selected from the group consisting of resin of epoxy type and resin of polyimide type (column 2, lines 46-50).

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Toyosawa (U.S. Pat. 6337257) in view of Ohuchi (U.S. Pat. 6271588) and further in view of Horiuchi et al. (U.S. Pat. 6242799).

Toyosawa and Ohuchi disclose the claimed invention except for the resin is formed of a material having an elastic modulus of 1.5×10^6 N/m^2 to 5.0×10^6 N/m^2.

Horiuchi et al. disclose a resin having a Young's modulus of 10 MPa or less (column 5, lines 50-55). Horiuchi et al. do not specifically point out the range of the Young's modulus is from 1.5×10^6 N/m^2 to 5.0×10^6 N/m^2, but 10 MPa or less is included in the range. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Toyosawa and Ohuchi to provide a resin are suitably used, as shown by Horiuchi et al.

5. Claims 5-8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. (U.S. Pat. 6136668).

- Regarding claims 5 and 18, Tamaki discloses a method of manufacturing a semiconductor device comprising the steps of:

grinding and polishing processes are performed for the back surface of the semiconductor wafer 4a; having an external connection electrode 3 or 5 on the opposite surface; and applying a patterned resist 33a and later on 33b on the back surface of the semiconductor wafer (figs. 7-10, column 7, lines 1-6). It would have been obvious that the adhesive material is formed of resin.

- Regarding claim 6, Tamaki discloses the step of cutting the semiconductor substrate after the step of applying (column 7, lines 43-45 and 55-60).
- Regarding claims 7-8, Tamaki discloses the step of previously grinding the surface to be abrased.

6. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. (U.S. Pat. 6136668) in view of Sakaguchi et al. (U.S. Pat. 6150194).

Tamaki et al. disclose the claimed invention except for the step of the resin is printed. Sakaguchi et al. disclose a method for producing a semiconductor device, comprising the step of: resin is printed (column 4, lines 60-64) to provide better control of thickness of the resin layer on a tape substrate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Tamaki et al. to control the appropriate thickness of the resin layer for the device, as shown by Sakaguchi et al.

7. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. in view of Takahashi et al. (U.S. Pat. 6153448).

Tamaki et al. disclose the claimed invention except for the step of the resin is applied by spin-coating. Takahashi et al. disclose a method for manufacturing a semiconductor device comprising the step of:

an insulating resin is spin-coated on the semiconductor wafer (column 8, lines 51-54) to adjust the thickness of the resin layer. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Tamaki et al. to adjust the thickness of the resin layer for the device, as shown by Takahashi et al.

(11) Response to Argument

Response to argument directed to the rejection of claims 1 and 17 as being unpatentable over Toyasawa (U.S. Pat. 6,337,257).

- The Appellant argues that "while the back surface 36 of the reference can be ground and polished to a mirror smooth surface by etching this does not suggest the physical structure of abrased of the back surface."

  The Appellant's arguments have been fully considered but they are not persuasive because determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

- The Appellant argues that "the back surface reinforcing member is not found either specifically or inherently in the reference. It has been apparently the position of the Examiner that the protective tape inherently provides a reinforcement."

  The Appellant's arguments have been fully considered but they are not persuasive because Toyosawa (U.S. Pat. 6,337,257) disclose the back surface 36 of the chips 32 are in contact with a protective tape (column 12, lines 29-31). It was noted that relative to the thickness of usual semiconductor chip a protective tape will inherently provide reinforcement.

- The Appellant argues that "the protective tape is used only in a manufacturing step and does not form structure of the chip in the context claimed."

  The Appellant's arguments have been fully considered but they are not persuasive because in the second embodiment Toyasawa discloses a protective tape that remains on the chip after the manufacturing is complete (column 12, lines 27-30).

- The Appellant argues that "a tape which is protective and is substantially thinner than the semiconductor chip it is submitted could not mechanically be a reinforcement."

  The Appellant's arguments have been fully considered but they are not persuasive because it is inherent that the protective tape of Toyosawa et al. is a reinforcement member because it inherently makes stronger the semiconductor chip and strengthens it by additional material or support.

- The Appellant argues that "claim 17 which is an article is somewhat broader than claim 1. This claim does distinguish over the reference because there is no back surface reinforcing member on said second surface."

  The Appellant's arguments have been fully considered but they are not persuasive because Toyosawa et al. disclose the back surface 36 of the chip 32 are in contact with a protective tape (column 12, lines 29-31) and wherein the protective tape is inherent a reinforcement member because it inherently makes stronger the semiconductor chip 32 and strengthens it by additional material or support.

Response to argument directed to the rejection of claims 2 and 4 as being unpatentable over Toyasawa in view of Ohuchi.

- In response to The Appellant's argument that the references fail to show certain features of The Appellant's invention, it is noted that the features upon which The Appellant relies (i.e., claim 4 includes specific resin. Thus the resin can reinforce the semiconductor substrate without impairing the bendability of the substrate. Applying such resins can also prevent the substrate form chipping or being scratched. Also the specific resin claimed is important. See the paragraph bridging pages 8 and 9 of the specification) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Response to argument directed to the rejection of claim 3 as being unpatentable over Toyasawa in view of Ohuchi and further in view of Horiuchi et al.

- The Appellant's arguments directed to the rejection of claim 3 have been fully considered but they are not persuasive because the primary reference discloses a protective tape that remains on the substrate after manufacturing is complete.
- In response to The Appellant's argument that the references fail to show certain features of The Appellant's invention, it is noted that the features upon which The Appellant relies (i.e., the resin can be applied rapidly reduced in thickness uniformly as explained in the specification page 3, lines 22-24) are not recited in

the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Response to argument directed to the rejection of claims 5-8 and 18 as being unpatentable over Tamaki et al. (U.S. Pat. 6,136,668).

- The Appellant argues that "element 31 is an adhesive which during manufacture holds a reinforcing plate 21. This reinforcing plate of course is detached and is not applied to the back surface of element 1."

  The Examiner in her rejection never discussed a reinforcing plate 21.

- The Appellant argues that "Tamaki does disclose a reinforcing member 9, but this reinforcing member is not on the back surface but is non metal layers 5 and 7. But even considering the totality of the reference, claim 5 distinguishes over the reference because claim 5 abrases to a mirror finish. This is not shown or suggested in the totality of the reference."

  The Appellant's argument have been fully considered but they are not persuasive because Tamaki et al. disclose a method of manufacturing a semiconductor device comprising the steps of:

  grinding and polishing processes are performed for the back surface of the semiconductor wafer 4a; having an external connection electrode 3 or 5 on the opposite surface; and applying a patterned resist 33a/3b on the back surface of the semiconductor wafer (figs. 7-10, column 7, lines 1-6 and 30).

The step of abrasing to a mirror finish or grinding to a mirror finish is equivalent to abrasing.

- The Appellant argues that "there is no electrical connection in the context claimed. While the reference does show element 3 on the top surface of the semiconductor device this is not an electrode connection and is only disclosed as a functional device."

The Appellant's argument have been fully considered but they are not persuasive because:

Tamaki discloses functional device 3 is on the top surface of the semiconductor wafer, wherein the functional device inherently functions as an electrical connection for the Tamaki's semiconductor package (figs. 7-10).

Tamaki discloses the metal layer 5, wherein the metal layer 5 serves to connect metal layer 7 and metal plate film 9; therefore, the metal layer 5 is an electrical connection for the semiconductor package.

Response to argument directed to the rejection of claims 9-12 as being unpatentable over Tamaki et al. in view of Sakaguchi.

- In response to The Appellant's argument that the references fail to show certain features of The Appellant's invention, it is noted that the features upon which The Appellant relies (i.e., resin 5 is of material having a small elastic modulus of approximately 1.5 to 5.0 x 10^6 N/m^2 since resin 5 with such a small elastic modulus does not impair the bendability of LSI chip 7. Such a value of elastic modulus is small relative to that of LSI chip 7 and it is thus a negligible value for

the entirety of a package, and applying resin 5 on LSI chip 7 can prevent the chip form chipping or being scratched, which allows the chip to be handled more readily.) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Response to argument directed to the rejection of claims 13-16 as being unpatentable over Tamaki et al. in view of Takahashi.

- The Appellant argues that "the Examiner has used the additional reference to Takahashi et al. ... This resin layer is for sealing and is not on the surface of the semiconductor layer as defined in the base claim 5."

The Appellant's arguments have been fully considered but they are not persuasive because this argument has no immediate apparent relevance to the issues presented by the rejection before us since an appellant cannot show nonobviousness by attacking references individually wherein the rejection is based upon a combination of references. In re Young, 403 F. 2d 754,757,159 USPQ 725, 728 (CCPA 1968).

It should be noted that the rejection of claims 13-16 are not based on anticipation, but rather, is based on obviousness.

Examiner relies on the combined teachings at Tamaki et al. and Takahashi. Takahashi is not relied on for teaching the resin layer is on the surface of the semiconductor layer. Takahashi is relied on for showing the resin layer is applied by spin-coating. The Examiner thus regards the Appellant's assertions as constituting

evidence that The Applicant has failed to consider as a whole the prior art teachings disclosed by the combining of the references.

- In response to The Applicant's argument that the references fail to show certain features of The Appellant's invention, it is noted that the features upon which The Appellant relies (i.e., the resin can be applied rapidly reduced in thickness uniformly as explained in the specification page 3, lines 22-24) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

DLN
October 31, 2003

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